

LENTINUS ARAUCARIAE,
AN AUSTRALASIAN MEMBER OF THE *L. BADIUS* - COMPLEX

by D.N. PEGLER*

SUMMARY. — The *Lentinus badius* - complex is defined and three species are recognized, *L. araucariae*, *L. badius* and *L. brunneofloccosus*. A revised, illustrated account of *L. araucariae* is provided, together with a key to species.

RÉSUMÉ. — Le complexe «*Lentinus badius*» est défini et trois espèces, *L. araucariae*, *L. badius* et *L. brunneofloccosus* y sont reconnues. Une clé d'identification en est donnée et s'accompagne d'une description illustrée de *L. araucariae*.

Lentinus badius (Berk.) Berk. is a familiar and distinctive species from South-west Asia, growing on the dead stumps and fallen branches of various tree hosts. Although it was originally described by BERKELEY (1842) from the Philippine Islands, further accounts have been provided from West Bengal as *Agaricus verrucarius* Berk. (1850), Nepal as *L. inquinans* Berk. (1854), Perak (Malaysia) as *L. brevipes* Cooke (1885), Singapore as *L. fuscus* Lloyd (1925) and Vietnam (Annam) as *L. inverseconicus* Pat. (1923). Additional collections have also been studied from Sikkim, Burma and Thailand. Unlike several other species of *Lentinus*, *L. badius* is restricted to the North-east corner of the Indian subcontinent and does not extend southwards, nor is it to be found in Sri Lanka.

BERKELEY (1854) referred to this species (as *L. inquinans*) as the «most beautiful of all Lentini», describing the verrucose velar squamules which are scattered over a velutinate pileal surface and which provide a very distinctive appearance. The pileal surface can vary considerably owing to the progressive disintegration of the velar covering, which initially envelops the primordial state, and also to the degree of gelatinization in the hypodermium. Hence the species has been repeatedly described under a number of names. Typically, the velar squamules are pyramidal, about 2-3 mm high, but soon become wea-

* Herbarium, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AE, England.

thered, increasingly flattened and discoid, until in old specimens they may be reduced to small, circular spots or stains. When LLOYD (1925) described *L. fuscus* from Singapore, he completely overlooked the flattened squamules although they can still be observed on the type collection. In older basidiomes, the lamellae frequently darken, especially towards the lamella-edge, and this has often led to confusion, either with *L. polychrous* Lév. (= *L. praerigidus* Berk., *L. kurzianus* Currey) or with species of the *L. velutinus* - complex.

During the course of preparation of a world monograph on the genus *Lentinus* Fr., the author has found two species which are extremely closely related to *L. badius*, yet have a quite different geographical distribution. This *Lentinus badius* - complex belongs to the Section *Lentinus* emend. Pegler (1975), and may be defined by the following characters. Macroscopically, the hymenophore configuration is unique within the genus, for instead of a series of radiating lamellae alternating with a series of corresponding smaller lamellulae, the lamellae are furcate, branching dichotomously one to three times and there are no independent lamellulae. The basidiome shows velangiocarpic development, resulting in a verrucose pileal surface and an evanescent, fibrillose annulus on the stipe. Microscopically, the hyphal system is dimitic with non-inflated generative hyphae and characteristic skeleto-ligative hyphae. The main skeletal element produces only a few ligative branches which form long, tapering, fili-form apices, often up to 500 μm or more. Such hyphae have sometimes been termed «bovista-type binding hyphae» and are quite different from the more complex, often coralloid, processes found in such species as *L. sajor-caju* (Fr.) Fr., and *L. polychrous*. Further, the hymenophoral trama is of radiate construction and, in a tangential vertical section, no evidence of any descending hyphal growth is observed so that the lamella-edge remains entire rather than denticulate.

The species most closely related to *L. badius* has an Australasian distribution and was described by HARIOT & PATOUILLARD (1903) under the name *L. araucariae*, from New Caledonia. The type collection is deposited at the Laboratoire de Cryptogamie, Muséum National d'Histoire Naturelle, Paris (PC). Additional material has been examined from Sabah and the Solomon Islands. Recently, HONGO (1976) described the same fungus, as *Panus verruciceps* Hongo, from Papua New Guinea. CORNER (1981) hinted at this species when he described a form of *L. badius* from Borneo and the Solomon Islands with subdistant lamellae. In view of the brief description given by HARIOT & PATOUILLARD, it is here decided to provide a detailed account of *L. araucariae*.

LENTINUS ARAUCARIAE Har. & Pat. in *Journ. Bot.*, Paris 17 : 11 (1903)

Panus verruciceps Hongo in *Rep. Tottori Mycol. Inst.* 14 : 96, fig. 1/4-7 (1976), *synon. nov.*

Pileus 3-10 cm diam., pliant, convex, umbilicate to almost infundibuliform; surface chestnut brown or paler, often with an olivaceous tint, subviscid when

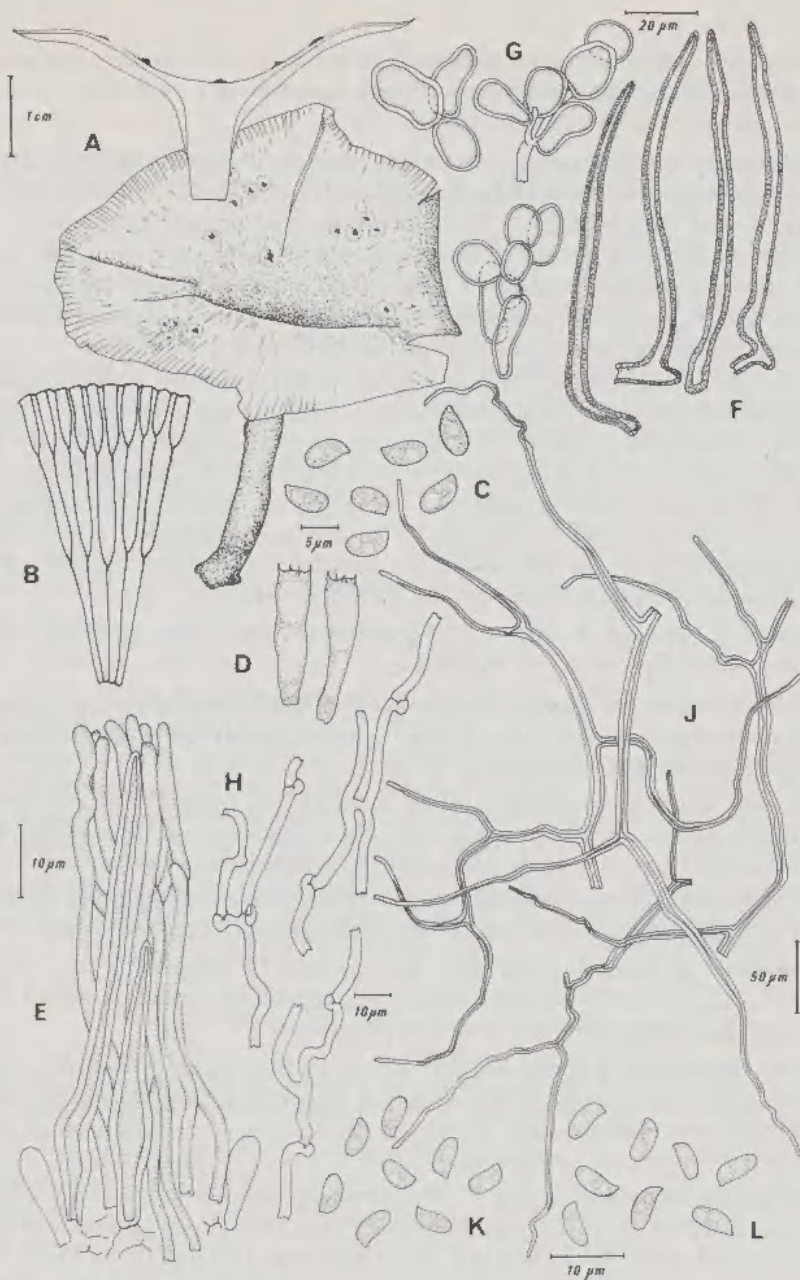


Fig. 1. — A-J: *Lentinus araucariae*. A, Habit and section of type (BERNIER 19), XI; B, diagram of hymenophore configuration; C, spores; D, basidia; E, hyphal peg; F, elements of pileipellis; G, elements of velar squamules; H, generative hyphae of context; I, skeleto-ligative hyphae of context; J, skeleto-ligative hyphae of context; K, spores of *L. badius* (CUMING 1983, type); L, spores of *L. brunneofloccosus* (GOOSSENS-FONTANA 860, type).

fresh, glaucous to finely velutinate soon glabrescent, with more or less concentric, scattered, erect squamules, up to 2 mm high, sulcate-striate from the margin to the mid-way zone; margin incurved.

Lamellae short decurrent, pale cream colour to pale greyish-brown, 2-4 mm wide, subdistant to moderately crowded, furcate with 2-3 dichotomies, edge entire.

Stipe excentric or central, 2-4 cm x 4-13 mm, cylindric or tapering below, ligneous, solid; surface whitish to cream coloured at the apex, initially velutinate developing appressed, fibrillose; rufous brown squamules towards the base, occasionally forming a felty annular zone at the base of the lamellae.

Context whitish, tough, 2-3 mm thick at the disk, very thin over the lamellae, consisting of a dimitic hyphal system with generative hyphae and skeleto-ligative hyphae. Generative hyphae 2.5 μ m diam., not inflating, hyaline, very thin-walled, frequently branching, with clamp-connexions. Skeleto-ligative hyphae 2.5-12.5 μ m diam., with a thickened wall (4 μ m), although sometimes only slightly so, and a broad lumen, hyaline or stramineous, with a main element, up to 500 μ m long, and 2-5 lateral, slender, tapering ligative branches, up to 600 μ m long, sometimes branching dichotomously.

Spores 5.7 x 3.3.5 (6 \pm 0.4 x 3.2 \pm 0.2) μ m, Q = 1.87, short ellipso-cylindric, hyaline, thin-walled, with few contents.

Basidia 16-20 x 4.5 μ m, clavate, bearing four, short sterigmata.

Lamella-edge a sterile zone lacking cheilocystidia and only occasionally emerging skeleto-ligative hyphae.

Hyphal pegs very abundant, 40-90 x 12-26 μ m, more or less cylindric or tapering to an acute apex, comprising 20-30 agglutinated, thin-walled generative hyphae together with 2-3 thick-walled, skeleto-ligative branches.

Hymenophoral trama irregular, of radiate construction, hyaline or yellowish-brown, similar in structure to the context. Subhymenial layer very narrow.

Pileipellis a disrupting trichodermial palisade of modified, erect, skeleto-ligative branches, 50-240 x 3-8 μ m, tapering and acutely pointed, with a thick, brown wall, arising from a gelatinized hypodermium.

Pileal squamules pseudoparenchymatous, of very highly branched, inflated elements, 11-40 x 6-14 μ m, globose, oblong ellipsoid or irregular, with a slightly thickened brown wall.

Specimens examined. — Sabah, Mt. Kinabalu, between Ulu Liwagu and Ulu Mesilau, 3 sept. 1961, CORNER 2696 (K); Papua New Guinea, Strickland River, 1885, Bäuerlen 60, Herb. COOKE (K); Oksapmin, 16 Dec. 1971, KOBAYASI 6085 (TNS, type of *P. verruciceps*); Solomon Islands, Malaita, Dala Cocoa Res. Stn., Dec. 1975, JACKSON D 26, M52 (K); New Caledonia, La Foa Distr., Tendéa, on *Araucaria*, July 1900, BERNIER 19 (PC, type of *L. araucariae*).

Lentinus araucariae differs from *L. badius* in the more brightly coloured and thinner pileus, the more widely spaced lamellae, the broader spores, and

a different geographical distribution. The context is often very thin so that the subviscid pileus may appear translucent when moist in older, glabrescent specimens.

HEIM (1964) published photographs of the type specimen of *L. araucariae* when he considered another related species from the Central African Republic. The latter species was apparently undescribed and HEIM provided the provisional name, *Lentinus bouayâ*, but it was never validly published under ICBN Art. 36. PEGLER (1971) described *L. brunneofloccosus* as a new species from the Republic of Zaire. A comparison of the material from both collections has shown the same species to be involved. *Lentinus brunneofloccosus* also belongs to the *L. badius* - complex, with similarities in the furcate hymenophore and metavelangiocarpic development. It differs from both *L. araucariae* and *L. badius*, however, in the floccose pileal surface, narrow cylindrical spores, and, surprisingly, the complete absence of hyphal pegs. It is possible that *L. placopus* Pat. & Har. (*Bull. Soc. Mycol. Fr.* 9 : 207, 1893) which was described from Middle Congo (formerly French Congo) represents an earlier name for this species. Unfortunately no material can be traced amongst the Patouillard collections, either at Paris or in the Farlow Herbarium at Harvard University.

The following key is provided to assist in the identification of the species of the *L. badius* - complex :

1. Hyphal pegs present, very abundant, pointed; pileipellis velutinate, consisting of acutely pointed, thick-walled hyphal elements :
 2. Pileus dark sepia to fuliginous; context up to 5 mm thick; lamellae crowded; spores 4.7-6.5 x 2.3 μ m, oblong cylindrical; South-east Asia 1. *L. badius*
 2. Pileus chestnut brown or paler, often with an olivaceous tint; context 2-3 mm thick; lamellae subdistant; spores 5-7 x 3-3.5 μ m, ellipso-cylindrical; Australasian islands 2. *L. araucariae*
1. Hyphal pegs absent; pileipellis floccose, consisting of inflated, obtusely rounded elements; spores 5.5-8.5 x 2-3.2 μ m, narrowly cylindrical; central and West equatorial Africa 3. *L. brunneofloccosus*

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